Effects of Intradiscal Proliferant Solutions on Fibroplasia Growth
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Introduction. Medical treatment today for recurring and chronic low back pain has been varied and not always successful. Clinically, some patients claim to have had a cure from chronic low back pain with the use of prolotherapy. In the literature, there does not appear to be any studies describing the use of proliferant injections into the intervertebral disc. Previous animal studies have shown that injections of sclerosant agents can stimulate fibroplasia growth in ligaments and tendons. The purpose of this study was to document the effects of proliferants to stimulate fibroplasia growth within the intervertebral disc.

Methods. Thirty-eight, 3–4 year old (degenerative disc model) New Zealand white rabbits under anesthesia were placed in a left, lateral position on an X-ray table. Using fluoroscopy to confirm needle placement, a sterile twenty-two gauge spinal needle was inserted into the L2-3, L3-4, L4-5 and L5-6 disc. Randomly the discs were injected with 0.1cc of either sodium morrhuate, 12/5% dextrose or the disc was stab only. The injections were repeated every two weeks for a total of three separate injection periods. The survival periods were 7 and 10 weeks, at which time the rabbits were euthanized. An additional group of rabbits were injected only once with the above proliferants. These rabbits were then euthanized at one week, two weeks and three weeks. A portion of each disc was removed for histological H&E staining and then the numbers of nuclei present were counted. The other portion of the disc was used to measure hydroxyproline and proline levels (indicators of collagen content).

Results. On no occasion were inflammatory, histocytes or eosinophil cells seen. Clumps of fibroblasts were seen. The statistical analysis was done by doing a one way ANOVA and paired t-test. Hydroxyproline versus cell count and the differences between the proliferants showed that there was no significant differences between any of the combinations of groups, with p-values >0.05. Looking at sodium morrhuate versus 12/5% dextrose only, we found that there were no significant differences with a p-value of 0.3088. However with respect to the time intervals, there was a significant difference between three and seven weeks and three and ten weeks, with p-values <0.0065, in both the 12/5% dextrose and the sodium morrhuate groups. There were higher cell counts in the three week groups.

Summary. The results of this study suggest that there is an early inflammatory reaction in the disc at earlier time periods. Other articles have shown that there is a decrease in the number of cells the longer the time after sodium morrhuate injections. This suggests that we look at later time periods (six months) in relationship to the cascade of mature fibroplasia growth, which is much later. The literature shows that sodium morrhuate represents an injury repair response in tendons and ligaments. Not seeing the same response in the disc could be related to the differences between the annulus fibrosis consists more of noncollagenous materials, contains both types I and II collagen and is avascular and alymphatic. There is still a need for further studies in understanding the role of proliferant injections in the intervertebral disc and its relationship to the degenerate disc.